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10/541,691	04/13/2006	Georg Bostanjoglo	2002P17431WOUS	1935

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Siemens Corporation
Intellectual Property Department
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EXAMINER

MALEKZADEH, SEYED MASOUD

ART UNIT	PAPER NUMBER
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1791

MAIL DATE	DELIVERY MODE
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11/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/541,691	Applicant(s) BOSTANJOGLO ET AL.	
	Examiner SEYED M MALEKZADEH	Art Unit 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 October 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on 08 July 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

In view of the amendment, filed on October 31 2007,
PROSECUTION IS HEREBY REOPENED. A new ground of rejection is set
forth below.

To avoid abandonment of the application, appellant must
exercise one of the following two options:

(1) File a reply under 37 CFR 1.111 (if this Office action
is non-final) or a reply under 37 CFR 1.113 (if this Office
action is final); or,

(2) initiate a new appeal by filing a notice of appeal
under 37 CFR 41.31 followed by an appeal brief under 37 CFR
41.37. The previously paid notice of appeal fee and appeal brief
fee can be applied to the new appeal. If, however, the appeal
fees set forth in 37 CFR 41.20 have been increased since they
were previously paid, then appellant must pay the difference
between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of
reopening prosecution by signing below:

Supervisory Patent Examiner

Yogendra N. Gupta



New Grounds of Rejection

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 22-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 22 disclose "a layer material with a single crystal structure formed on the intermediate layer." in which this limitation fails to differentiate between claimed single crystalline layer which is formed on the intermediate layer with the single crystalline substrate which is also bonded to the intermediate layer. In other words, claim is indefinite for failing to particularly point out the claimed single crystalline layer material which is formed on the intermediate layer is different and distinct from the substrate which is boned with the intermediate layer. Therefore, the subject matter which applicant regards as the invention is not distinctly claimed.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Kear et al. (US 4,250,229)

Kear et al ('229) disclose a metallic work-piece layer component in which include a crystalline portion (12b) and has a similar function as a substrate and also two amorphous metal structure interlayer (10a) and (10b) in which have a similar function as an intermediate layer. (See lines 38-41 column 8 and figures 1-2). Further, Kear et al ('229) teaches that two amorphous metal structure interlayer (10a) and (10b) are diffusion bonded and brazed to the single crystalline portion (12b). (See abstract and lines 29-36, column 3; lines 65-68 column 9, and lines 1-10 column 10; also lines 3-6, column 14; and figure 2)

Therefore, as to claim 22 and 23, Kear et al. ('229) teach a substrate in which has a single structure, an intermediate layer which has no single-crystal or directional structure

bonded to the substrate. Further, substrate is a single crystalline layer material which is formed on the intermediate layer.

As to claim 24, Kurz et al ('792) meet all the limitations of a component product, and no or little patentable weight is given to the process limitations as claimed in claim 24.

The prior art, thus meets all the claim limitations, and therefore Kear et al ('229) anticipates claims 22-24.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 11-15, 17-21, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kurz et al (US 6,024,792) in view of Kear et al (US 4,250,229).

Kurz et al ('792) disclose a method for producing single crystal structures from metallic super-alloys by providing a substrate with a single-crystal structure and epitaxially growth of a layer material via a first material application process. Further, Kurz et al ('792) teach applying one or more mono-crystalline layers epitaxially over the surface of the substrate to build up one or more group of layers. (See lines 58-67 column 1; lines 1-33 column 2). As it was pointed out, Kurz et al ('792) teach epitaxially growing the layer material with one or more layer, in which one of the middle layers can be considered as an intermediate layer. Further other layers are grown also epitaxially. (See lines 62-67, column 1). It is noted that mono-crystalline structure is as the same as single crystal structure.

Kurz et al ('792) also teach a monocrystalline turbine blade as a substrate is built up and further developed mono-

crystallinically layer by layer until the original size and shape of the workpiece has again been achieved. (See lines 19-23, column 2)

Kurz et al ('792) further teach the substrate has a plurality of single-crystal structures from the epitaxial growth of the layer material. (See lines 22-48, column 2)

Kurz et al ('792) also teach a heat treatment transforms at least part of the intermediate layer with the substrate and layer material into a region having a crystalline structure. (See lines 10-32, column 3)

Kurz et al ('792) further disclose the intermediate layer is applied with a directional microstructure (See lines 12-23, column 2). Furthermore, Kurz et al ('792) teaches material composition and composition ratio of constituents for the intermediate layer is adapted to a main composition ratio of main constituents of the substrate. (See lines 23-48 and 64-67, column 2 and lines 1-10, column 3)

Also, Kurz et al ('792) disclose depositing a single crystal material over layer made by epitaxial growth of a layer applied by a first material application. (See lines 58-67, column 1; and lines 21-33, column 3).

Further, Kurz et al ('792) teach depositing one or more single crystal layers through epitaxial growth which are applied by epitaxial growth method as a first material application process in which the deposited layer over the intermediate layers is considered as an overlayer, and the built up layers between the substrate and the over layer is considered as intermediate layers in which the intermediate layers are also built up by a deposition process as a second material application process. (See lines 1-67, column 1 and lines 1-54, column 2)

Kurz et al ('792) also disclose the depositions of layers are performed through an electrical deposition process. (See lines 49-54, column 2)

However, Kurz et al ('792) do not teach the intermediate layer does not have a single crystal or directional structure, as claimed in claims 11 and 25.

In the analogous art, Kear et al. ('229) disclose that interlayer foil with an amorphous metal structure produces an improved brazed or diffusion bonded structure (See lines 29-36, column 3) which the interlayer is neither a single crystal nor directional structure on the substrate. Also Kear et al ('229) teach the intermediate layer is applied via a second application

process. (See abstract and lines 29-36, column 3; lines 65-68 column 9, and lines 1-10 column 10; also lines 3-6, column 14)

Further, Kear et al. ('229) teaches the advantages for applying an interlayer foil with an amorphous structure in order to improve brazed or diffusion bonded structure of the epitaxially grown layered component, and further to provide an improved method and interlayer foil for brazing and bonding.

(See lines 25-36, column 3)

Therefore, It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Kurz et al. ('792) by providing a non single-crystal or non-directional structure intermediate layer and applying the intermediate layer via a second application process in order to provide an improved brazed or diffusion bonded single crystal structure, as suggested by Kear et al ('229).

Claims 16 and 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kurz et al. ('792) and Kear et al. ('229) as applied to claims 11-15, 17-21, and 25 and further in view of Caballero (US 5,213,907).

Combined teaching of Kurz et al ('792) and Kear et al ('229) disclose all the limitations of a process for producing

single -crystal structures from metallic superalloys as discussed above in rejection of claims 11-15, 17-21, and 25, however, fail to teach the intermediate layer is generated by an electrochemical process, as claimed in claim 16, or by an electro-deposition process, as claimed in claim 26.

In the analogous art, Caballero et al. ('907) discloses epitaxial deposition of a metal alloy such as Ni-B, Co-B, Ni-Co, Ni-Fe, Co-Fe, Ni-Co-Fe which are comparable with intermediate layer by an electrochemical process on a surface of a substrate. (See lines 14-23, column 2)

Also, Caballero ('907) teaches a method of electrodepositing metal alloys which causes the alloy to diffuse into the surface of a substrate and chemically bond by a polar covalent bond to the substrate at the interface between the alloy and the substrate (See lines 28-34, column 2). Further, Caballero ('907) teaches the metal alloy, which is deposited by the electrodepositing method is dense, hard, ductile and highly reflective (See lines 21-25, column 2)

Further Caballero et al. ('907) teaches the advantages of employing an electro-chemical or electro-deposition process for the layer's deposition in order to improve complexity of the

deposition process in which the layers can be deposited quickly and easily. (See lines 37-41, column 2)

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify combined teachings of Kurz et al. ('792) and Kear et al ('229) by generating an intermediate layer through an electro-chemical or electro-deposition process in order to apply deposition process of intermediate layer quicker and easier, as suggested by Caballero ('907).

Response to Argument

With respect to claims 22-24, applicants argue Kear FIG. 2 illustrates a three layer structure wherein the outer layers are amorphous (i.e. having no single-crystal or directional structure), and the intermediate structure is described only as "crystalline". Thus, the order of the layers in Kear is inconsistent with the order of the layers of claim 22 and thus Kear does not support a rejection under 35 USC 102.

This is not found persuasive, because as claimed in claim 22, the claim does not differentiate between the single crystalline substrate bonded to intermediate layer and single

crystalline layer material formed on the intermediate layer, and there is not any layer order in the component product as claimed in claim 22. Further, FIG. 2 of Kear et al ('229) disclose a metallic work-piece layer component in which include a crystalline portion (12b) with a similar function as a substrate and also two amorphous metal structure inter-layers (10a) and (10b) in which have similar function as an intermediate layer. (See lines 38-41 column 8 and figures 1-2). Further, Kear et al ('229) teaches two amorphous metal structure inter-layers (10a) and (10b) are diffusion bonded and brazed to the single crystalline portion (12b). (See abstract and lines 29-36, column 3; lines 65-68, column 9, and lines 1-10 column 10; also lines 3-6, column 4). Therefore, disclosure by FIG 2 of Kear et al ('229) anticipates the claimed subject mater of claim 22-24.

Also, with respect to claims 22-24, applicants argue there is no teaching in Kear et al. (US 4,250,229) of any "single crystal" structure. To the contrary the illustration of FIG. 2 of Kear et al. ('229) shows a columnar grained structure, which teaches away from a single crystal structure.

This is not found persuasive because Kear et al. ('229) clearly teaches a crystalline metal layer structure in which is bonded to the interlayer amorphous structure layer (See lines 25-

63, column 3, lines 38-42, column 8). Further, Kear et al ('229) teaches about the single crystal and application of TMP (Transient Meta-stable Phase) bonding for the joining of cast single crystal super-alloys. In such instances, it is an object having a single crystal structure extends across the joint region of a workpiece assembly (lines 65-68 column 9 and lines 1-8, column 10).

Also Kear et al. ('229) clearly disclose the work piece as a substrate has an aligned single crystal structure, as claimed in claim 22. (See lines 3-6, column 14)

Applicants argue that there is no motivation to combine Kurz et al. (US 6,024,792) and Kear et al. (US 4,250,229) because there is no motivation to combine these references, and the combination fails to describe the claimed invention.

This is not found persuasive combination of Kurz et al ('792) and Kear et al. ('229) is a proper combination rejection because Kurz et al ('229) in view of Kear et al ('229) clearly teach the claim limitations of claims 11-21 and 25, and further Kear et al ('229) clearly provide motivation for the combination rejection of claims 11-21 and 25. Kear et al ('229) clearly disclose the advantages for applying an interlayer foil with an amorphous structure in order to improve brazed or diffusion

bonded structure of the epitaxially grown layered component, and further to provide an improved method and interlayer foil for brazing and bonding. (See lines 25-36, column 3)

Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Masoud Malekzadeh whose telephone number is 571-272-6215. The examiner can normally be reached on Monday - Friday at 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra N. Gupta can be reached on (571) 272-1316. The fax number for the organization where this application or proceeding is assigned is 571-272-8300.

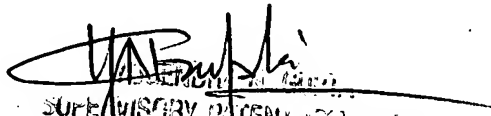
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